



Cleaner, Cheaper Australian Fuels

A VISION FOR STATIONARY
ENERGY LIQUEFIED
PETROLEUM GAS



CONTENTS

1. EXECUTIVE SUMMARY	1
Our Vision	3
What is LPG	5
Did you know	6
10 Point Action Plan for industry and government	7
<hr/>	
2. WHY LPG – THE COMPELLING FACTS	9
<hr/>	
3. A THOUSAND USES FOR OVER 5 MILLION AUSTRALIANS – The Australian LPG story in more detail	11
<hr/>	
4. SUPPORTING REGIONAL AND RURAL AUSTRALIA	18
Energy on the move	18
Natural disaster assistance for Australian communities	18
Immediately accessible clean energy	19
<hr/>	
5. CHALLENGES TO OVERCOME	20
The clean energy policy imbalance	20
The role of government	22
The role of the LPG Industry	23
Policy drivers for government	23
<hr/>	
6. OUR COMMITMENT TO CREATE JOBS AND GROW THE ECONOMY	24
Already benefiting the Australian economy	24
Commitment to innovation in LPG	25
<hr/>	
7. CONCLUSION	26
<hr/>	
8. ABOUT GAS ENERGY AUSTRALIA	27
<hr/>	

1. EXECUTIVE SUMMARY

Australia needs to take control of its own energy future by embracing cleaner, cheaper and available Australian sources of energy.

Often taken for granted, Liquefied Petroleum Gas (LPG) can contribute to Australia’s future energy needs as a cleaner, cheaper and more readily available source of energy than conventional fuels.

Our Vision document outlines the contributions that LPG already makes to more than 5 million Australian household and business users, for household and water heating, recreational use or for powering industries like agriculture and manufacturing.

Australia’s energy mix has undergone significant changes based on world markets, government policy, technology advances, consumer needs and public opinions.

We prescribe expensive renewables, even when they aren’t the best for the job; while we overlook the real strengths of Australia’s natural resources that currently can deliver cleaner and affordable fuel sources, that in many cases can do the job better – like LPG.

Contributing \$3.5 billion to the national economy, Australian LPG supports 2,500 direct jobs, and has over 1,000 uses ¹. This includes fuel for water and home heating, cooking, lighting, machinery, power generation, automotive fuel and for manufacturing and construction. While most people are aware of the automotive uses, LPG can be used so widely and so readily for a range of other stationary energy and industrial uses, that it often gets forgotten or overlooked – including by policy makers, who often make rules that support less clean alternatives or technologies that are not always right for the job. This is why our Vision’s 10 Point Plan for the future calls on industry to increase awareness of cleaner, affordable, Australian LPG – in addition to automotive uses.

Along with the need to increase community awareness of the cost and economic benefits of LPG, our 10 Point Plan urges industry and governments to realise the economic environmental benefits of low emission LPG.

The Plan also asks governments and industry to support cleaner air, and improved health outcomes through greater use of LPG.

To enable the right technologies for the right jobs to deliver a lower carbon and lower polluting future, our Plan identifies the need for government policy, procurement and other support to apply equally to all cleaner energy sources. This would fulfil policy commitments to technology neutrality and not prescribing specific energy sources.

LPG can contribute to Australia’s future energy needs as a cleaner, cheaper and more readily available source of energy than conventional fuels.



Lack of harmonisation of product and transport safety standards across Australian jurisdictions also hinders the take-up of LPG and our Plan urges governments to reduce regulatory costs and red tape.

The LPG industry believes that LPG is a better choice because of its environmental and health benefits, the fact that it is accessible and affordable, provides security of supply, and that LPG is already supporting the Australian economy.

Australians deserve to be able to access cleaner, available and affordable local sources of energy, including LPG; rather than conventional fuels, because it's better for our environment and good for Australian jobs.

This Vision also provides a number of key facts and case studies to support the role of LPG, in a better future for Australians.

For example, when used to power household hot water systems, LPG can be better for climate change outcomes than current solar electric hot water systems, producing almost 15% or 2.5 tonnes less CO₂ emissions. Yet 'green schemes' and other government support mechanisms will often support the higher emitting solar electric, rather than the better fit for purpose gas option.

Other government schemes provide unsustainable subsidies for fixed gas pipelines in cases where 'virtual pipelines' supplying LPG represent a more economic alternative. Our Plan calls on industry and governments to recognise the role and importance of virtual pipelines to save money, and provide energy faster to Australia's dispersed communities. With Australia's dispersed population, reports have shown that virtual pipelines are often less expensive than fixed pipeline infrastructure. Now that's innovative!

Innovation in the LPG sector includes engineers and designers devoting more attention to the development of LPG and renewable hybrids, that can provide more reliable power than renewables alone; and they are cleaner, cheaper energy generators than those currently using higher emitting, higher polluting imported diesel. Potential hybrid appliances include heat pumps, solar energy systems and photovoltaic power generators. Our Plan commits industry to invest in innovation to find better solutions to the challenges of supplying and consuming energy in a sustainable manner.

Changing policy settings and circumstances, mean that the industry struggles to compete with fuels receiving significant government rebates and policy support. Government does not always support the most affordable, cleanest or most sensible fuel choice for every application. That means getting governments to support consumer choice for the right energy for their circumstances could deliver significant benefits to taxpayers, consumers, the environment and the economy.

Better government policy is crucial to ensuring this cleaner, affordable and available energy source continues to support thousands of Australian jobs, businesses, our local environment and importantly Australian families.

Policy settings for LPG impacts over 5 million Australians. So getting the balance right is important.

Government policy should support the right fuel, for the right place, for the right application – not the popular option that doesn't do the job as well.

LPG is the better choice for Australians, and we have a Vision of how to achieve greater uptake of undervalued Australian LPG.



OUR VISION

With vast resources of LPG available to our domestic market, Australia is well placed to provide a secure, reliable, versatile and affordable supply of fuel to customers.

As fuel that is often overlooked, our vision is for LPG to be valued and accepted as a real competitive option for supplying consumers' energy needs.

We want a better, cleaner Australia with a strong economy where:

- We continue to serve and build on the advantages currently experienced by over 5 million LPG users, supported by 2,500 Australian jobs;
- Australia takes advantage of its affordable and available sources of LPG, to provide cleaner energy to Australian families;
- LPG drives more regional jobs, by employing Australians to produce and distribute LPG for the energy needs of the country;
- Families have cleaner homes and working environments, through greater uptake of LPG;
- All families are empowered to use the best energy that suits their circumstances;
- Off grid power generators aren't run on imported diesel when cleaner alternatives are available;
- Governments give equal opportunities to all energy sources, so the right source for the right outcome for the right application is supported;
- LPG cuts living costs by increasing choice and competition in the fuels market;
- LPG complements renewable energy technologies that can't support base load power, and is a part of the suite of innovative energy solutions such as hybrids;
- Rural and regional communities having more access to reliable and affordable LPG through virtual pipelines; and
- We create more Australian jobs, by supporting an Australian domestic energy and export industry.



To realise this vision of cleaner, secure, reliable and affordable energy future, we should aim to see the following achieved:

- Transition 40% of current industrial coal and fuel oil fired off grid electricity generators to LPG;
- 90% of forklifts powered by cleaner, affordable LPG;
- Maintain investments in the virtual pipelines, that currently service 100% of regional and rural towns across Australia;
- Have 20% of households using LPG hot water systems;
- A 30% increase in households using LPG for home heating;
- Replace 30% of diesel consumption by the farming sector for glasshouses, grain drying and irrigation;
- 30% increase in the use of LPG to power remote Australian communities that are not on the electricity grid;
- Green buildings are promoted, and increase by 10%, the instances of replacing electric air conditioners with gas powered ones;
- 60% of emergency and back-up generators for disaster assistance are run on LPG;
- Replace 20% of diesel consumption in Australia's mining sector with LPG;
- Every island in the Great Barrier Reef currently using a diesel generator, to convert to using a cleaner LPG generator or LPG hybrid generator;
- 7 million regional Australians benefit from improved policy settings encouraging the adoption of the cleanest technology;
- Governments no longer support higher emitting and more expensive fuel sources for the community by taking a more objective approach to policy development; and
- Australia to become a world leader in developing LPG related technology, driven by research and innovation and expertise in handling LPG.



WHAT IS LPG?

Liquefied Petroleum Gas is a generic term used to describe both Propane and Butane.

Propane is used predominantly for domestic heating and cooking applications, where Butane is used in special commercial applications. A mix of both is used as a transport fuel.

LPG is a naturally occurring high value bi-product of natural gas and oil extraction, from Australia's wet gas fields. Over 80% of Australia's LPG production comes from this source. LPG is also produced by refineries in the production of petrol and diesel.

The extraction of LPG from our gas and oil fields provides significant added value for producers for their export and domestic market.

LPG is a low carbon energy-rich fuel, having a high calorific value, which provides high efficiency benefits for heating and cooking.

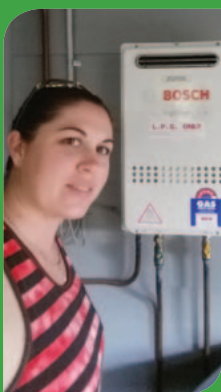
LPG is colourless and odourless, and has a unique capability to be easily transformed from gas to liquid with minimal pressure. One litre of liquid LPG equals 270 litres of gas, making LPG more economical to be stored or transported as a liquid than as a gas. This versatility and flexibility provides the perfect solution to meet our regional energy needs.



DID YOU KNOW...

- LPG responds to the indoor stationary energy demands of more than **5 million** users, servicing more than **670,000** regional and remote and **265,000** capital city customers.
- There are over **400,000** Australians and thousands of businesses in regional Australia that are not on the electricity grid – many of which run on dirtier, more expensive diesel generation.²
- There are over **1,000** uses for LPG.³
- **\$4 billion** has already been invested in stationary energy LPG infrastructure networks such as ports, refueling facilities, tanks, storage facilities and pipelines.
- LPG industry contributes more than **\$3.5 billion** a year to the national economy.
- Converting existing Queensland homes from electric hot water to gas hot water will save up to **246,000** tonnes of CO₂ per annum.⁴
- Transitioning coal facilities to gas facilities in Queensland alone will save **80,000** tonnes of CO₂ per annum.
- Australia exported **\$800 million** worth of LPG in 2014-2015.⁵
- By 2020, **4.5 million** tonnes of LPG will be produced in Australia per annum.
- LPG is accessible everywhere, with the industry travelling **60 million** kilometres per year, or 4 times around the world each day.
- Australian stationary energy LPG supports **154,000** Australian businesses.
- We have almost **80** years supply of LPG, and that's just the sources we know about so far.⁶

LIZ HAYWARD, TAMWORTH



After much consideration, Liz replaced her old electric hot water system with an LPG hot water system, because of its efficiency and because it is a better option for the environment.

The installation of an LPG hot water system saw Liz's three person household electricity bills reduce from an average usage of 1650kWH per quarter at a cost of \$340.00 to 660kWH at a cost of \$190.00 per quarter excluding service charges.

"I love the LPG hot water system and I would recommend it to anyone who was needing to buy a new hot water system to replace an electric one. Not just for the environment but also the amount of money you save and less electricity you use."

CASE STUDY 1

10 POINT ACTION PLAN FOR INDUSTRY AND GOVERNMENT

1 Industry to increase awareness of cleaner, affordable, Australian LPG – in addition to automotive uses.

While many people are aware of LPG as a transport fuel, not many recognise the significant contribution it makes in other walks of life. And that's why LPG has become a forgotten fuel, often undervalued by policy makers who too often provide regulatory and financial support to other technologies – even if they aren't the best choice.

While policy makers need to ensure they live up to claims of 'technology neutrality', the industry itself needs to remind Australians of the benefits of cleaner, affordable Australian LPG, and how it is already helping households. The LPG industry will promote, inform and educate customers, community and governments on the benefits and value proposition of LPG as a cleaner, affordable and available alternative – not only to traditional fuel sources, but in many cases to 'policy preferred' alternative and renewable sources.

2 Government policy, procurement and other support to apply equally to all cleaner energy sources.

Governments should fulfill commitments to ensure that policies don't favour one technology or energy source, by ensuring appropriate tax settings, and removing regulation and policy prescriptions that discourage the use of LPG.

Given the significant environmental benefits of LPG, as well as its ability to be easily accessed in rural and regional communities, LPG should be provided the same support by governments as other competing technologies, and procurement policies should include LPG among preferred fuel types. Support should be for the required outcomes – not for a particular technology. This applies to 'green schemes' and sometimes even to retail subsidies for pensioners. Examples where settings discriminate against LPG include ARENA and the small-scale Renewable Energy Scheme.

3 Industry and governments to realise the environmental benefits of low emission LPG.

LPG has lower carbon emissions and fewer particulates, so it is better for the environment. An LPG hot water system is cleaner than a solar electric hybrid system, producing almost 15% less carbon emissions – and yet doesn't receive any government rebate.

Government policy settings should remain technology neutral, by reflecting the need to promote cleaner fuels – not just supporting renewables. LPG should be included in government energy strategies and policies to reduce carbon emissions.

4 Governments and industry to support cleaner air, and improved health outcomes through greater use of LPG.

The World Health Organisation concluded that diesel exhaust can cause cancer in humans, contains types of pollution most likely to harm humans, and is particularly dangerous because its sources are close to where people live and work.

Through the National Clear Air Agreement, both nationally and locally, governments should implement measures to reduce Australians' exposure to dirty diesel fumes, and encourage the use of low emission appliances and generators, including gas.

5 Industry and governments to recognise the role and importance of virtual pipelines to save money, and provide energy faster to Australia's dispersed communities.

Because communities and policy makers often don't see the operation of logistic supply chains for LPG and other gas supplies, they aren't aware of the benefits and jobs that come from LPG in rural and regional Australia.

Indeed, sometimes governments make policy decisions to subsidise otherwise unviable fixed infrastructure, that often only service limited communities, and which puts the 'virtual' pipeline of existing businesses, jobs and communities at risk. A recent feasibility study by the Victorian Government, found that the high cost of laying pipeline has resulted in an increase of virtual pipelines solutions, particularly into regional communities.⁷

Governments should not waste taxpayer dollars on subsidised fixed pipelines at the expense of virtual pipelines and ensure feasibility studies are conducted on the best methods for delivering LPG to regional communities. Virtual pipelines can be built cheaper and faster, saving the community money.

6 Governments to support consumer choice for the right energy for their circumstances.

Governments should stop increasing energy costs, by making electricity prices more reflective of actual costs, and consider providing community service obligation payments directly to consumers in regional and remote areas; and thus allowing them to choose the cleanest and cheapest energy options for their circumstances.

As outlined in the Energy White Paper, 'consumers should have easy access to information to encourage the productive use of energy', and that information 'enables them to make informed choices about their energy use'⁸. It's not that regional communities shouldn't get support, but the subsidies for regional communities should support the best choice of energy for their energy circumstances, not just the one a government has chosen to support.

7 Governments to reduce regulatory costs and red tape.

Governments should investigate the harmonisation of product and transport safety standards such as different state regulations for the transport and storage of LPG across State and Territory borders. This should include the automatic acceptance of internationally approved appliances. Red tape imposes huge costs of compliance and administration which are passed on to consumers.

8 Industry to invest in innovation.

The industry will continue to innovate to find better solutions, such as hybrid generation, as further demonstration that LPG is a flexible option, that can be transported any place at any time. The industry will continue to investigate the feasibility of bio-LPG and its benefits to the Australian market, unless government policy deters it. Already in the United Kingdom, Bio LPG has been given accreditation under their Renewable Transport Fuel Obligation.⁹

9 Continue to support communities withstand and recover from natural disasters.

Because of its portability, and the commitment from the industry, LPG will continue to play a critical part in supporting communities in the event of natural disasters, just like it has done in the past. Governments at all levels should include LPG back-up generators as part of their emergency response plans.

10 Improve collaboration between government and industry, to collate and report data on LPG usage and benefits.

As noted in a recent report from the Office of the Chief Economist in the Commonwealth Department of Industry, Innovation and Science,¹⁰ limited data exists on energy use and activity in the residential sector. This means that policy settings are often based on unsupported assumptions or political considerations, rather than good data. The industry will work with governments to increase the data available on LPG usage in the home, commercial sector and rural and regional communities, and will collate and report the data to support policy development.

2. WHY LPG – THE COMPELLING FACTS

CLEANER FOR THE ENVIRONMENT

Australians deserve to have access to cleaner and affordable fuels, because it's better for the environment, safer for our children and puts less pressure on household bills.

For example, if every Australian home converted their electric hot water system to one powered by LPG, it would reduce carbon emissions by around 6.2 million tonnes each year, demonstrating that LPG is an environmentally friendly fuel.

SUPPORTING THE AUSTRALIAN ECONOMY

The stationary energy LPG industry supports jobs in metro and regional locations, right across Australia, employing over 2,500 people directly and indirectly – including through contractors, distributors and agents.

Already \$4 billion dollars has been invested into infrastructure to support the LPG industry, and the industry could invest further except for red tape and policy settings, that create disincentives to invest in this cleaner, affordable fuel.

CLEANER AIR FOR AUSTRALIAN FAMILIES AND WORKERS

As Australians look to cleaner, local environments, as a lower emitting fuel, LPG is a better choice for domestic heating, and is better for our air quality due to its very low emissions of particulate matter.

	AUSTRALIAN LPG	Other Energy Sources
Carbon Dioxide	54% lower ↓	Electricity ✗
Nitrous Oxide	83.3% lower ↓	Diesel ✗
Particulate Emissions	Almost eliminated	Diesel ✗

AFFORDABLE AND AVAILABLE ENERGY NOW AND IN THE FUTURE

LPG doesn't need poles, wires or pipelines to provide energy, so it has lower infrastructure costs, and creates a flexible market that is more open to competition.

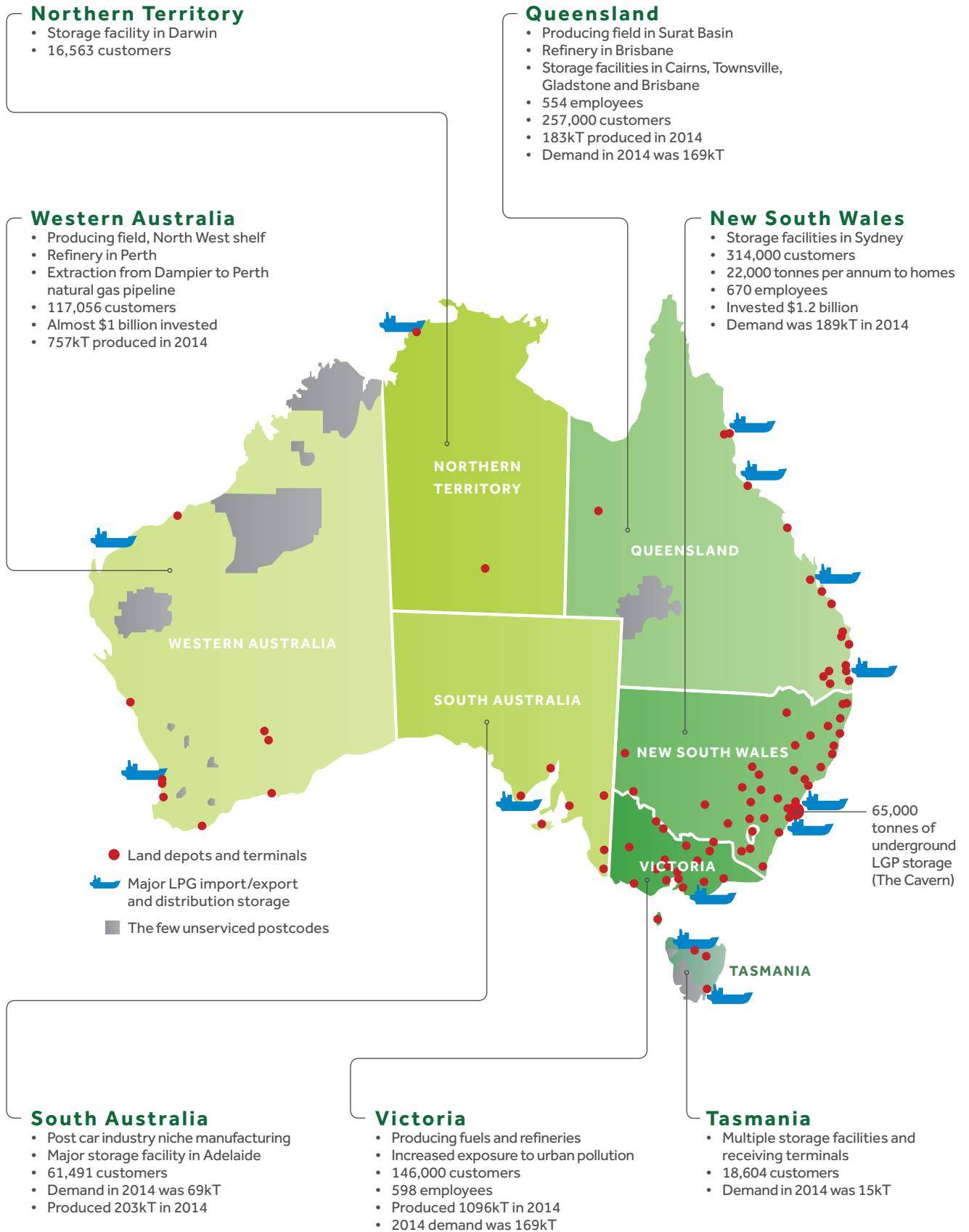
A recent report by the Bureau of Resource and Energy Economics (BREE) also noted, that LPG has one of the lowest costs of production of any fuels in Australia, out to 2050.¹¹ Not only is LPG cheaper now, but it will remain cheaper compared to other fuel alternatives, well into the future.

AVAILABLE AND SECURITY OF SUPPLY

Australia has a lot of LPG. Not only do we have more than enough to support domestic demand, but Australia is now a net exporter of LPG. This supply means there is a low vulnerability to supply disruptions, based on its multiple origins, numerous routes and entry points, and flexible supply chains.

We currently have identified almost 80 years supply of LPG, and that's just the sources we know about so far.¹²

LPG in Australia – Accessible and Available



LPG is readily available through virtual pipelines to every postcode in Australia, where customer demand requires it.

3. A THOUSAND USES FOR OVER 5 MILLION AUSTRALIANS – The Australian LPG story in more detail

Today, the Australian LPG industry contributes more than \$3.5 billion a year to the national economy. If policy settings didn't favour imported and more expensive options, it could provide more economic support again.

LPG is used as both a transport fuel and a stationary power across a range of industry sectors, including manufacturing, mining, agriculture and Australia's leisure industry.

Over five million Australians, among several billion people around the world, use LPG for a variety of applications. Cooking and heating are well known, but LPG is also used to generate power, clean and

dry clothes, cut the grass in the garden at home, and even produces heat that keeps bugs away.

LPG appliances have increased in popularity, along with the knowledge that LPG is a cost effective, energy efficient, and environmentally friendly way to provide energy – not only during power outages, but in everyday applications as well.

Some of the 1000 everyday uses for Australian LPG



CLEANER, AFFORDABLE ENERGY FOR AUSTRALIAN HOMES AND RECREATION

Most commonly known for its use in water heating and household cooking, using LPG in Australian homes can save money, and is a more convenient and immediately accessible choice.

LPG is a lower carbon alternative to other fossil fuels, like coal-fired electricity and imported diesel. Using LPG in the home, instead of electricity, for water heating, cooking or home heating, can reduce greenhouse gas emissions by up to 70%.¹³

When used for cooking, LPG spreads the heat more evenly across the base of cooking implements, and doesn't take time to heat up like electric stoves – so it will save you time in the kitchen.

Unlike other countries, Australia doesn't have long winters, so has less need for expensive central heating. LPG autonomous heaters provide instant heat and increased energy efficiency, by allowing a lower overall temperature setting throughout the home or the indoor space. Because they don't rely on power from the electricity grid, they are more dependable in natural disasters and power outages.

Australian LPG can power air conditioning units, is perfect for patio heaters and barbecues, can fuel back-up generators when businesses are affected by storms, power on-site incinerators and can even be used for mosquito and bug killers.

Few Australians know that using LPG can be better for climate change outcomes, than current conventional electric and even solar electric hot water systems. Over 15 years, the average LPG instantaneous hot water heater emits 39 tonnes less than an electric hot water heater. LPG hot water systems are even cleaner than solar electric hot water heaters, producing almost 15% or 2.5 tonnes less CO₂ emissions.

Despite all of the benefits of using LPG in the home, government rebates prop up the solar industry, and encourage its use in households, even when it's not always the right choice or necessarily cleaner and cheaper.

Instantaneous LPG hot water heaters save consumers almost \$500 over its life span, compared with electric storage hot water heaters.



LPG hot water systems are even cleaner than solar electric hot water heaters, producing almost 15% or 2.5 tonnes less CO₂ emissions.

WHAT IS A VIRTUAL PIPELINE?

In a country as vast as Australia, service delivery and the provision of everyday necessities such as water, electricity and telecommunications can be very expensive and logistically difficult to provide.

All Australians, including those living in rural and region towns, deserve easy access to cleaner, cheaper, Australian fuels – but they shouldn't have to wait until funding becomes available, and the infrastructure is finally built.

Virtual pipelines of Australian LPG can help. A virtual pipeline is a cheaper and faster alternative to a fixed pipeline, and is the supply and transportation of gas by truck, instead of a physical pipeline infrastructure network.

Virtual pipelines don't require much permanent infrastructure and can change their route or destination immediately, based on community and business needs.

In areas where there are no gas networks, or when there's an issue with infrastructure, virtual pipelines can provide communities with a cleaner, cheaper source of secure and accessible energy.

For much of Australia, virtual pipelines are more cost effective than expensive fixed pipelines.

ACCESSIBLE AND SECURITY OF SUPPLY

Australia has vast reserves of LPG, with around 80% of LPG produced in Australia coming from offshore and onshore oil and gas fields.¹⁴ And because most Australian LPG is sourced from natural gas processing, refinery closures will have little impact on the security of domestic supply. With production levels well in excess of current market demand, LPG is exported, earning revenue and contributing even further to our local economy. We have almost 80 years supply of LPG, and that's just the sources we know about so far.

Because Australia produces more LPG than it consumes, the LPG supply chain is not dependent on international supply chains, so you can guarantee security of supply.

Around 94 per cent of operating fields producing gas in Australia also produce oil or condensate, or both. The majority of our LPG is produced from natural gas fields in Australia, located both on shore and off shore, with distillation plants separating the LPG from the methane. Indeed, this is not only good for domestic gas supply, it helps the economics of the export natural gas industry. LPG is helping the economy even in ways most people don't know.

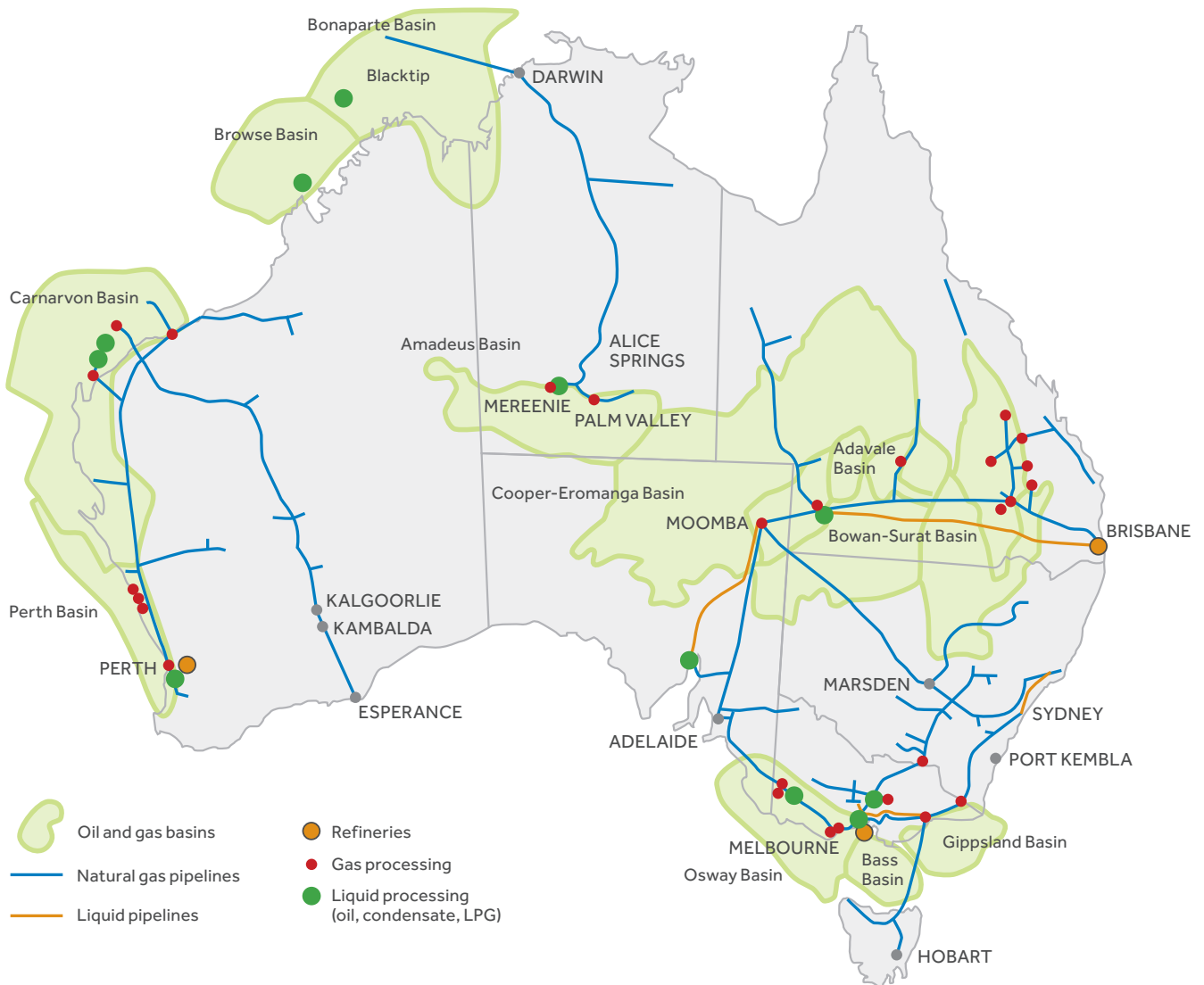
There are no technological obstacles to rapidly increasing available LPG volume to market and with \$4 billion worth of infrastructure built and operating, the LPG industry is ready to immediately service an increase in domestic demand. But there have been regulatory, and other policy decisions that do put this supply and opportunity at risk.

Having virtual pipelines that can reach everywhere in Australia, means that Australian households and businesses can have the immediate access to cleaner, affordable Australian LPG they want and deserve; without the need for fixed pipelines, that are more expensive, and slower to come to fruition.



Australia's Oil and Gas Resources

LPG has abundant upstream sources.



CLEANER, AVAILABLE AND AFFORDABLE ENERGY FOR AUSTRALIAN INDUSTRY AND BUSINESS

Flexible, reliable and cost-effective energy is important to ensure Australian businesses are profitable and sustainable.

For businesses, LPG can provide a cleaner and affordable source of energy for hot water heating, lighting generators, back-up generators, cooking, patio heaters and grills, laundry appliances, air-conditioning, factory machinery, commercial drying and pharmaceutical production.

Gas is currently the largest source of energy in the manufacturing and construction sector¹⁵, because it is cleaner, affordable and easily accessible.

Poor government policy that doesn't support cleaner and cheaper LPG, won't just impact on families at home, it will impact on Australian businesses and jobs.

LPG should be the fuel of choice for restaurants, cafés and pub owners, because it is perfect for the Australian lifestyle, and is a jack-of-all-trades in the commercial sector.

LPG tumble driers dry clothes in around 50% less time, producing around half the greenhouse emissions of electric dryers, whilst costing almost 50% less to run. The quality of the dryness and softness of the dried clothes processed by LPG dryers, is also far superior.

It is also not commonly known, that LPG is already widely used in renovation activities, such as in paint removal, lighting, soldering, welding, drilling, lighting and concrete treatment. LPG can also be used as a feedstock in chemical production.

LPG forklift trucks present an excellent alternative, to both diesel and electric counterbalance forklifts, for a wide range of materials handling applications. They are cheaper to run, and produce less emissions – so are better for enclosed spaces.

Poor government policy, that doesn't support cleaner and cheaper LPG, won't just impact on families at home – it will impact on Australian businesses and jobs, including industrial, manufacturing, tourism, chemical production, small businesses and the retail sector. Government should support businesses that choose to use LPG, because it not only is a more convenient and cost efficient choice for the business, but it also helps lower emissions, and create a cleaner environment for Australians.

CLEANER, AVAILABLE AND AFFORDABLE ENERGY FOR THE AUSTRALIAN AGRICULTURE AND MINING INDUSTRIES

As the community, and in turn farmers, demand more environmentally friendly production methods, LPG is a great choice for Australia's farming industry. It enables farmers to farm efficiently, using LPG as a cleaner, green, versatile energy source for a broad range of farming applications.

Practical applications for LPG in agriculture include its role in crop-drying, poultry breeding, irrigation, thermal desiccation, incineration, insect repellent, greenhouse and animal shed heating and water heating.

A recent report by Infrastructure Australia, found that increasing energy costs are likely to reduce the productivity and sustainability of irrigated agricultural businesses. In particular, sugarcane producers have expressed concern that rising energy costs are making it difficult for them to meet the target of doubling agriculture production.¹⁶ By supporting Australian LPG, Government can also assist the agriculture sector, which wants to be able to use affordable fuel sources like LPG.



NORA VALLEY FARM, YANDINA QLD



Nora Valley farm at Yandina, Queensland, uses LPG as heating for the green houses where they grow tomatoes. Since switching to cleaner, cheaper LPG, they've been able to lower their production costs and expand into new markets, doubling the size of their greenhouse in the last twelve months.

Using LPG means they can control the heat in the greenhouse and produce better quality tomatoes for Australian families. It also means they no longer have black soot from their diesel generators which land on the greenhouse roof, and stop direct sunlight coming through.

Nora Valley employs 60 people directly and indirectly and is a great Australian small business.

In the mining industry (where they are either off-grid or require supplementary generation), LPG can be used for power applications, for a range of applications. Uses include back-up generators, heating and catering for worker accommodation. In 2012-13, the mining industry consumed 9% of energy in Australia, but very little of that energy comes from affordable Australian LPG. We should be encouraging the mining industry to use cleaner, affordable and accessible LPG.

Case studies show that gas and solar hybrid generators for off-grid power generation, actually provide a lower emitting, lower polluting and more cost effective solution than the more common diesel solar hybrids – more common because ARENA funding actually supports the higher emitting alternative.

RELIABLE ENERGY FOR REMOTE AND EMERGENCY POWER

There are over 400,000 Australians in remote and regional communities, and thousands of industry and business sites that require off-grid electricity. As one of the cleanest conventional fuels available, LPG is a viable choice to facilitate the generation of off-grid electricity.

We should aim to have less off grid generators run on imported diesel, and more on cleaner, affordable Australian LPG.

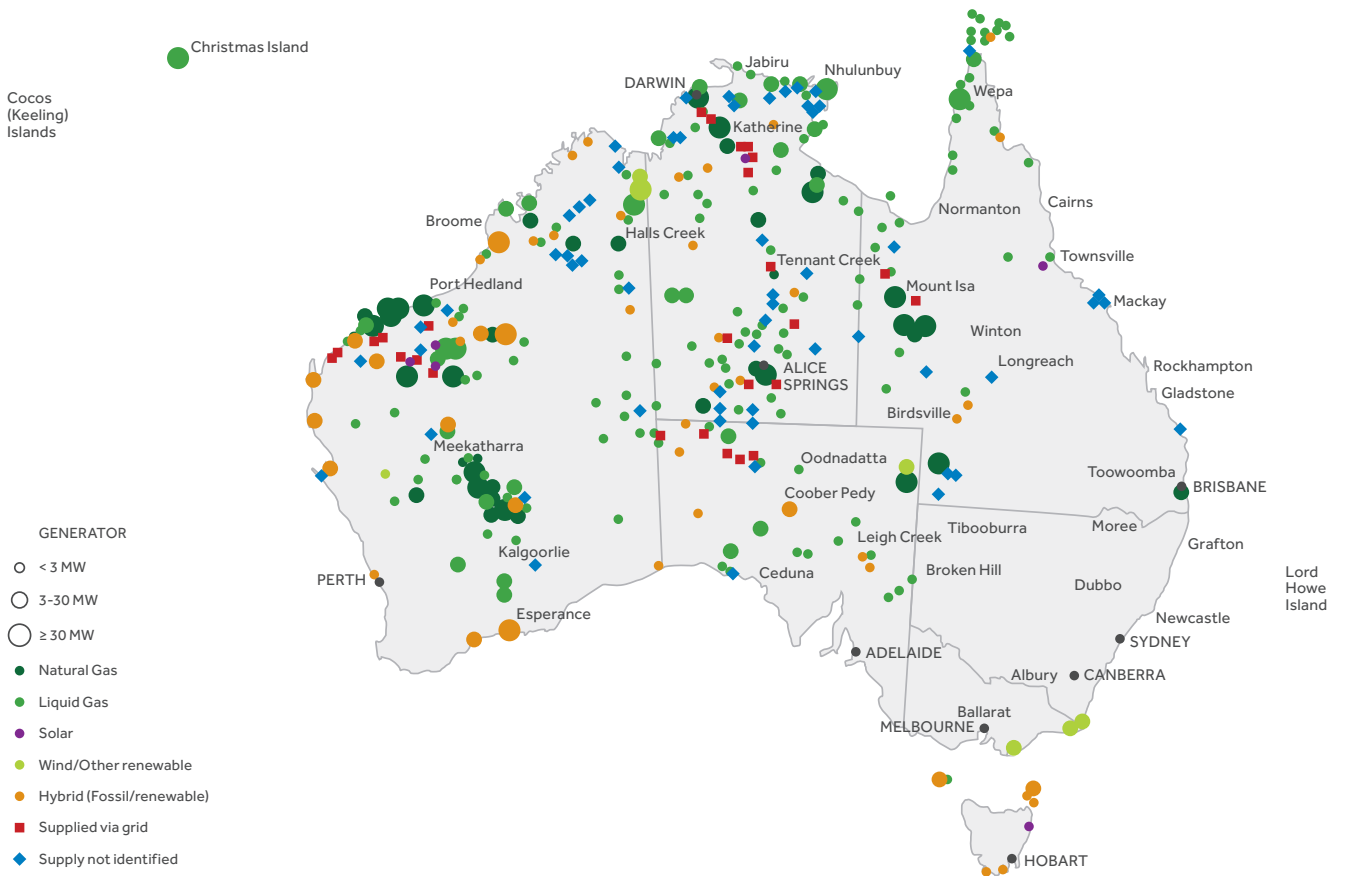
With a wide variety of packaging and storage options, and transportation in low-pressure tanks, LPG is available across Australia – including through 'virtual pipelines' to support communities not serviced by natural gas grids.

The portable nature of LPG makes it ideally suited for emergency situations, whether for heating, cooking or power generation. This is particularly relevant after natural disasters, which are a regular occurrence in Australia's dispersed communities; and other disruptions, when LPG can be delivered long before poles, wires and pipelines can be repaired.

LPG is easily stored in both large tanks or in smaller gallon cylinders, and has unlimited shelf life in comparison to conventional alternatives. It is available during power outages, and LPG-powered generator units have lower noise levels than diesel ones.

As one of the cleanest conventional fuels available, LPG is a viable choice to facilitate the generation of off-grid electricity.

Off-grid electricity generators Australia, 2011-12



Source: Bureau of Resources and Energy Economics

CLEANER, AFFORDABLE FRONTLINE SERVICES

As an environmentally friendly and mobile source of energy, LPG has a range of big and small practical applications that support frontline service jobs in Australia. These include lawn mowers for community parks, removing chewing gum and graffiti from local streets and buildings, powering lighthouses and providing reliable energy to hospitals and road crews.

At schools and universities, LPG applications can do everything from lighting classrooms to heating the school pool, and providing energy efficient air conditioning in summer.



4. SUPPORTING REGIONAL AND RURAL AUSTRALIA

ENERGY ON THE MOVE

Not only does LPG originate from some of Australia's rural and regional communities, but it is often the best choice for powering and supporting many of those same communities. LPG is cleaner and affordable, and it is easily transportable with 'virtual pipelines'.

LPG is available anytime, anyplace and anywhere. That makes it an ideal fuel option for rural and regional homes, businesses and communities.

LPG's person-to-person distribution system has created a rich distribution network of local and national distributors across Australia. This includes those significant areas beyond the reach of existing reticulated natural gas networks.

No other commercial fuel has this flexibility for transportation offering, providing the capability for being one of the lowest infrastructure cost options for energy, compared to electricity and natural gas.

This flexible distribution network provides security of supply across regional Australia at competitive prices. Because LPG can be transported by virtual pipelines, Australians living in rural and regional communities don't have to wait for expensive permanent pipelines to be funded and built.

NATURAL DISASTER ASSISTANCE FOR AUSTRALIAN COMMUNITIES

Examination of recent Australian and New Zealand disasters highlight the importance of restoring access to energy as soon as possible, to mitigate against social hardship for households, and economic loss for business and industry.

Large-scale energy infrastructure is prone to disruption during the course of these events. The time taken to repair this infrastructure, and restore access for households and businesses can be substantial, and can involve significant economic loss.

LPG, with its portability and mobile infrastructure, has the capacity to play a significant role in improving the energy resilience of local and regional communities across Australia. By diversifying energy use in the home and in businesses, people can build a degree of self-sufficiency in regard to sourcing energy needs – both during and following major storm events and natural disasters.



A report prepared by the Australian National University, on the benefits and costs of the provision of post-cyclone emergency services in Cairns following Cyclone Yasi in 2011, suggested that issuing households with LPG generators is a cost effective solution to dealing with a loss of electricity.¹⁷

LPG is easily transportable, is available when off-grid systems collapse, is extremely portable and can be used as fuel for power, cooking and heating. LPG should be used by Australian Governments as part of their post disaster recovery plans.

LPG IN DISASTER RECOVERY, COOPERS CREEK, QUEENSLAND

CASE STUDY 3



In February 2013 following ex-tropical Cyclone Oswald, a landslip cut off the road into Coopers Creek, leaving 140 residents without access to essentials. While the New South Wales SES helicopter was delivering food and medicine to residents, they were left without access to energy.

Working together, the local Elgas Branch Manager and the SES, arranged for LPG cylinders to be airlifted by helicopter to the residents of Coopers Creek including the local Coopers Creek School and the local Elgas supplier showed residents how to connect up the LPG cylinders to power their generators, refrigerators and cooking facilities.

No other source of energy is as easily accessible and as easy to be transported as, cleaner, affordable LPG.

IMMEDIATELY ACCESSIBLE CLEAN ENERGY

Perhaps the greatest asset of LPG, and the associated LPG storage and distribution infrastructure, that has been established over the past 40 years, is the portability of the gas for use.

Unlike the electricity and natural gas industries, which require poles, wires and pipelines, LPG infrastructure is flexible, and provides the opportunity to deliver energy in a variety of markets, in locations ranging from the centre of Australia's capital cities to remote locations in the far north and north-west of the country. This means that rather than waiting for a fixed infrastructure development, consumers in regional and remote areas can easily access LPG for their immediate needs.

As bottles of energy, LPG can be easily transported almost anywhere in Australia, making it an ideal fuel source for rural and regional communities across Australia.

All Australians should have access to cleaner and affordable LPG, but that doesn't have to involve expensive fixed pipeline infrastructure.



5. CHALLENGES TO OVERCOME

Despite the significant benefits from LPG from reduced carbon emissions, more reliable power, Australian jobs and even export income – lack of community awareness, and sometimes perverse policy settings, are undermining the future of this cleaner, affordable and readily available Australian fuel.

That puts millions of dollars of economic benefits, 2500 jobs and supply to over 5 million Australians at risk.

THE CLEAN ENERGY POLICY IMBALANCE

HOUSEHOLD HOT WATER SYSTEMS

The community wants, and should have access to cleaner fuels – because they are better for the environment, reduce carbon emissions, improve our air quality and are more sustainable.

We believe governments across the world have gone about cleaning up our environment in the wrong way, and are not always choosing the energy source that has the lowest emissions over their life cycle.



The Australian Government's Energy White Paper rightly states, that "policies should not favour one technology or energy source over another"¹⁸, and yet Government "clean green" schemes like ARENA funding and the RET scheme, clearly favour wind and solar technology – despite LPG often being cleaner and cheaper over its life cycle.

For example, LPG gas hot water systems are up to 73% cleaner than electric hot water systems; whereas solar electric hybrid hot water systems are only 68% cleaner. And yet, government policy – the RET scheme – provides a rebate on the solar electric hybrid, which isn't the cleanest option.

If the objective of the RET scheme is to actually lower carbon emissions in Australia, LPG appliances should be included.

The solar LPG hybrid is even cleaner again, with emissions savings of up to 85%.

Electric storage water heaters are used as the 'cost of abatement' benchmark, because despite being the water heaters that produce the most greenhouse gas emissions, they are still used by about half of all Australian households.

If the objective of the RET scheme is to actually lower carbon emissions in Australia, LPG appliances should be included.

Despite being one of the cleanest energy sources, LPG on its own, doesn't receive any subsidies or project funding, and its users and customers don't receive any rebates. Without a government funded rebate, solar hot water systems are one of the most expensive systems to buy. But with a rebate of up to \$1,500 available, this less clean option becomes a cheaper option, at the expense of other energy consumers, than the naturally cleaner, affordable LPG systems. The lower emitting solution is made a more expensive choice for customers – simply because of government policy.

An LPG hot water system is cleaner than a solar electric hybrid, but because it isn't a renewable energy source, it isn't eligible for a government rebate.

CONSIDERATION OF WHOLE LIFE CYCLE EMISSIONS

Energy impacts, and reductions in emissions, should be considered on a complete life cycle basis – not just emissions and reductions when in use. Energies'

externalised costs should be integrated in a transparent way, in order to facilitate meaningful comparisons.

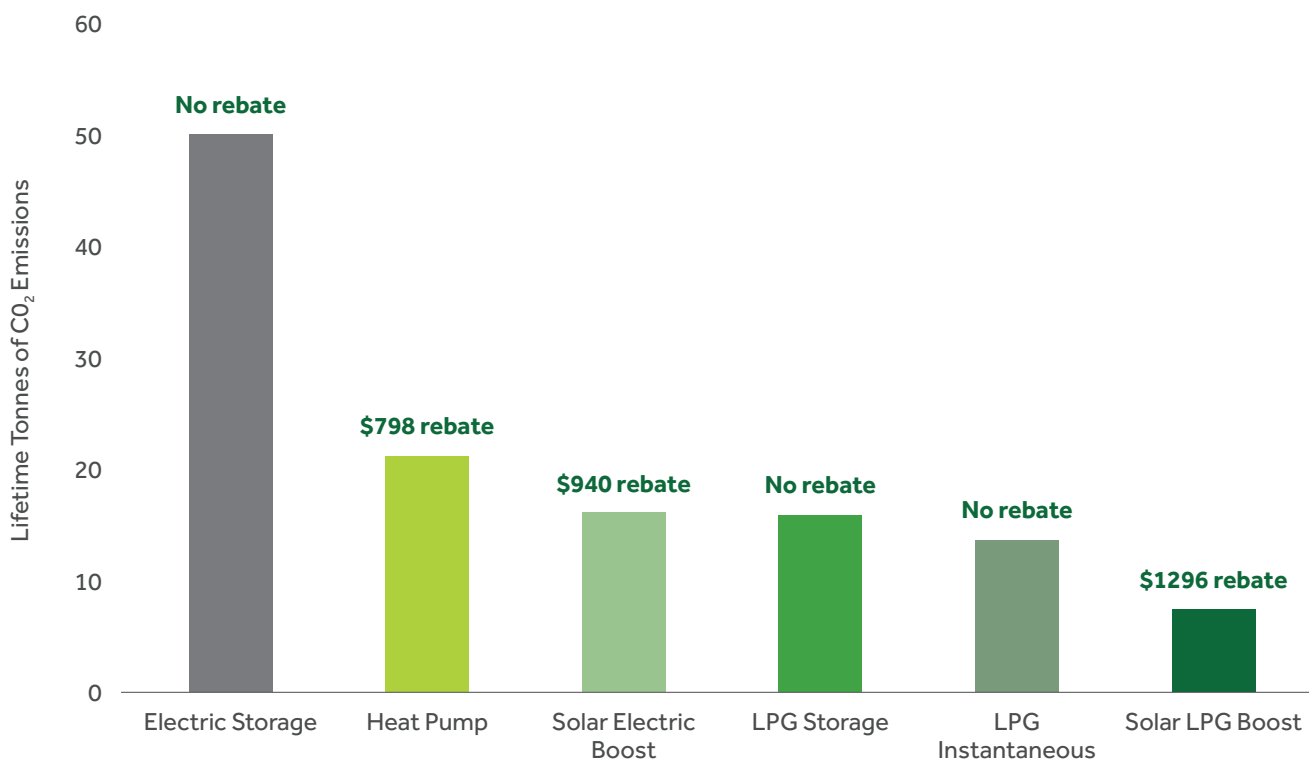
Like renewables, LPG appliances displace electric products, and produce fewer greenhouse gases. These benefits are not given adequate weight in current government policy, or policy considerations.

As you can see from the figure below, the average instantaneous LPG hot water heater emits less carbon over a 15-year life cycle, than an electric or solar hot water system.

Governments must adopt a genuinely fuel neutral approach, and include displacement technologies that can deliver cost effective abatement outcomes. That is why we support the comments of the Minister for Resources, Energy and Northern Australia, when he said, "... the Australian Government is committed to a technology-neutral policy and regulatory framework to support new energy sources and enable change, innovation and transformative technologies".¹⁹

Regrettably, whilst that might be the intent, that's not currently the policy outcome.

Water Heater Emissions and Rebates



Source: Pitt and Sherry, Greenhouse gas emissions performance of various types of residential water heaters, and emission abatement opportunities, 2015.²⁰

THE ROLE OF GOVERNMENTS

The Australian LPG industry wants to work with governments to promote the growth of clean energy.

This Vision has outlined specific examples where government policy has limited the options, to achieve the best outcome, by 'picking winners' rather than outcomes. Industry will work with governments to develop a policy that is technology neutral; rather than populist solutions, that sometimes don't deliver either cost effective solutions or lower emissions.

As an energy source already servicing over 5 million households and businesses, supported by over 2500 jobs, we cannot afford to let bad policy decisions with perverse outcomes stifle this Australian industry.

Policy settings should support Australians to make the best choice, to suit the circumstances their families and businesses face – rather than prescribing particular technical solutions.

Government must include cleaner LPG in RET schemes, make it easier for small scale projects to apply and be assessed under the ERF. Government must recognise

Australian LPG as a cleaner, affordable and easily accessible energy source in policy documents, and a transition fuel that will support renewables and in its own right.

While projects involving switching to LPG are eligible to bid under the ERF, the scheme was not designed for small scale projects and its administration deters practical direct action outcomes for households and small businesses that switch to cleaner LPG.

Policy settings should support Australians to make the best choice to suit the circumstances their families and businesses face – rather than prescribing particular technical solutions.

CASE STUDY 4

SELECTED SEEDS, PITTSWORTH QLD

Selected Seeds is an industry leader for tropical pastures, domestically and internationally, and until recently used a combination of diesel and solar energy for grain drying.



Initially, Selected Seeds used a solar/diesel hybrid, because through the renewable energy grant program, it was the cheapest option. However, they have now replaced the diesel component of the hybrid with LPG, because it is cleaner and improves energy efficiency during winter as well as saving 10% in costs.

In this instance, a government rebate facilitated the use of a diesel generator, instead of promoting cleaner LPG.

THE ROLE OF THE LPG INDUSTRY

Australian LPG continues to be a cleaner and affordable choice for Australians, but Australians have started to take the industry for granted.

The industry will work to promote the benefits of Australian LPG – its cleaner and affordable properties, the thousands of jobs it supports and the millions of dollars in economic benefits.

The industry is committed to continuing to grow the LPG business through active promotion of LPG and its benefits, to ensure that LPG plays a key role in ensuring that Australia meets the energy needs of its growing population, but we can't do this alone.

We want to work with governments to promote the growth of clean alternative energies, particularly

those suffering from a lack of awareness amongst the community.

We want to work with governments to promote the growth of clean alternative energies, particularly those suffering from a lack of awareness amongst the community.

Policy Drivers for Government



6. OUR COMMITMENT TO CREATE JOBS AND GROW THE ECONOMY

The Australian LPG industry has been contributing to economic growth for over 70 years, and today, the Australian LPG industry contributes more than \$3.5 billion a year to the national economy. But there is more that can be achieved, and more that can be done.

The Australian LPG industry is committed to being an integral part of the Australian economy.

A recent report by the Office of the Chief Economist, in the Department of Industry, Innovation and Science, lists LPG as one of the main energy sources used in households; and that gas for space heating, appliances, water heating and cooking are an important component of residential energy use.²¹

It is vital that the LPG industry remains viable. Not only to ensure we get the best out of this natural Australian advantage, but because any downturn due to government picking more expensive and less suitable “winners”, will impact significantly on Australian families, with the loss of a cleaner and more affordable source of energy for their homes.

ALREADY BENEFITING THE AUSTRALIAN ECONOMY

All the basic requirements are in place to support growth. With almost \$4 billion already invested, the existing LPG infrastructure can support substantial growth of the industry, eliminating the need for additional major investment.

The LPG industry supplies over 670,000 regional and remote customers, and over 265,000 customers in capital cities and in total supports more than 5 million LPG users from industrial uses to household and BBQ users.

Of the almost \$4 billion already invested, close to \$1 billion of that was for the construction of ports and terminals to export LPG to the world, with exports totalling \$800 million in 2014-15.

As an export, LPG returns more value per unit than coal and LNG combined.

Indeed, as a value add by-product from natural gas upstream development, LPG makes LNG development more valuable helping meet export gas demand while directly supporting domestic gas needs.

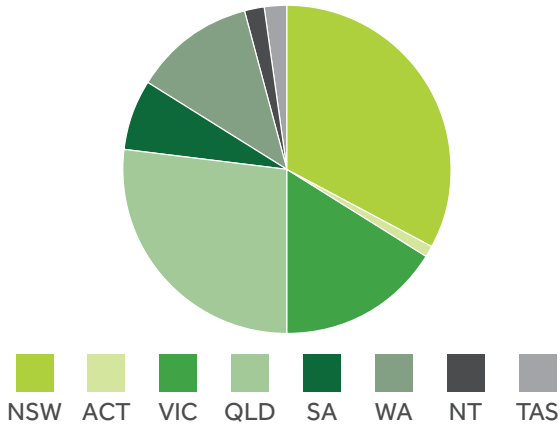
So not only is LPG providing economic value in its own right by supporting 1000 practical uses in Australia it is an important contributor to the Australian economy by helping to facilitate the economics of cost effective natural gas extraction.

The growth of the LPG industry will be hindered if government policy settings continue to disregard its benefits to the economy and environment. It would undermine economical natural gas extraction as well as impact domestically in every state in Australia – with over 80% of LPG users being households. The breakdown of users in each state and territory can be seen in the charts below.

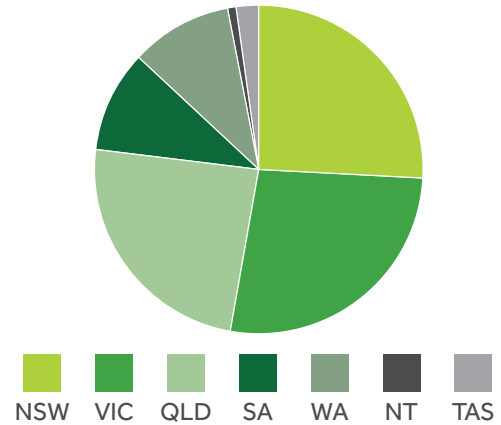
The LPG industry is committed to making further investment to provide secure and safe energy for Australia.



Customers by State



Stationary Energy Demand by State (2014, tonnes)



COMMITMENT TO INNOVATION IN LPG

Innovation isn't just making smaller and more intuitive smart phones; it's about making technology advances that will improve the lives of everyday Australians, and make going about our daily business more productive.

The LPG industry is constantly researching and developing new and improved products that will allow Australians to do more things using cleaner, affordable Australian LPG.

The newly developed LPG String Trimmer, means Australians will soon be able to tidy up their gardens without petrol fumes blowing back in their face. LPG outboard motors will protect wildlife and waterways, by eliminating the possibility of a toxic petrol spill, as well as reducing greenhouse gas emissions.

As well as continuing to develop new products and applications for LPG, the industry will continue to work to provide innovative solutions for the needs of their existing and prospective customers.

LPG enables highly efficient, decentralised power generation, through self-containing generators and combined heat and power systems. It also complements renewable energy sources, which depend on specific weather conditions or daylight.

Currently only 2% of stationary energy generation is from renewable energy sources, because of its lack of reliability. But engineers and designers in the LPG industry are devoting their attention to the development of LPG and renewable hybrids, that can act as cleaner, cheaper energy generators than those currently using higher emitting, higher polluting imported diesel. These potential hybrid appliances include heat pumps, solar energy systems and photovoltaic power generators.

SNOWY RIVER HOLIDAY PARK, NSW

CASE STUDY 5



Snowy River Holiday Park is a family friendly holiday spot with abundant wildlife overlooking the Snowy River. The holiday park uses a hybrid LPG/solar system to power their amenities block, accommodation heating and hot water heating.

The hybrid system means that even on days when it is cloudy, raining or snowing, guests and staff at the holiday park are never without power.

The owners chose an LPG/solar hybrid because it's environmentally friendly, cheaper, efficient and reliable.

This is a real life innovative example of how LPG and renewables can work together, but dysfunctions in the 'green schemes' don't support examples like this.

7. CONCLUSION

LPG is clearly the better choice for Australian households and businesses. It has the ability to lower emissions, lower energy bills and be readily available – all while supporting Australian jobs and the economy.

But governments need to act now, and stop making policy decisions to support alternative energy sources that aren't always cleaner or affordable, resulting in poor policy outcomes that impact on already existing fuel industries like LPG.

Energy policies should be technology neutral, therefore allowing consumers to choose the right fuel for the right application – and not simply supporting imported and less clean technologies.

BREE has confirmed that LPG is one of the fuels that has the lowest production costs out to 2050. That lower cost over time, being cleaner than electricity and diesel alternative and often more fit for purpose than renewables for many applications, means LPG is the better choice for Australians, who are demanding cleaner air, less pollutants and more affordable energy.

LPG is playing an important role in shaping Australia's future energy policy, and lowering our carbon footprint. LPG is a significant contributor to the Australian economy, both in exports, and in providing access to an extremely transportable, low carbon energy source for Australians everywhere.

With the support of government, industry and consumers, LPG can play a pivotal role in establishing a more sustainable energy future for Australia.

Industry and government must work together to ensure the LPG industry continues to service over 5 million Australians, contribute billions of dollars to the Australian economy, and lower our carbon emissions.

LPG is a better choice.



8. ABOUT GAS ENERGY AUSTRALIA

Gas Energy Australia is the national peak body that represents the bulk of the downstream alternative gaseous fuels industry, which covers Liquefied Petroleum Gas (LPG), Liquefied Natural Gas (LNG) and Compressed Natural Gas (CNG).

The industry comprises major companies and small to medium businesses in the alternative gaseous fuels supply chain – refiners, fuel marketers, vehicle and equipment manufacturers, vehicle converters, consultants and other providers of services to the industry.

The Association's mission is to optimise the value and benefits of gaseous fuels for the benefit of Australia's national interest – to achieve energy security and economic prosperity in a lower carbon economy, and the Australian community in providing access to affordable energy.

The Association focuses on advocating the value and benefits of the fuels through engagement with the federal government, state authorities and the community.



ENDNOTES

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- 7 [https://www.parliament.nsw.gov.au/prod/parlment/committee.nsf/0/7b5e67499c487c86ca257d95001d08e2/\\$FILE/Presentation%20notes%20-%20Energy%20for%20the%20Regions'%20-%20Regional%20Development%20Victoria%20\(16%20June%202014\).PDF](https://www.parliament.nsw.gov.au/prod/parlment/committee.nsf/0/7b5e67499c487c86ca257d95001d08e2/$FILE/Presentation%20notes%20-%20Energy%20for%20the%20Regions'%20-%20Regional%20Development%20Victoria%20(16%20June%202014).PDF)
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- 11 Bureau of Resources and Energy Economics (BREE) 2014 Australian Liquid Fuels Technology Assessment
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- 17 <http://www.pc.gov.au/inquiries/completed/disaster-funding/submissions/submissions-test/submission-counter/sub001-disaster-funding.pdf>
- 18 Federal Government, The Energy White Paper – at a glance, April 2015 <http://ewp.industry.gov.au>
- 19 <http://www.joshfrydenberg.com.au/guest/SpeechesDetails.aspx?id=341>
- 20 Notes: Emissions are Scope 1 and 2 carbon equivalent emissions produced to deliver 264 litres of water per day at 45 degrees for a medium household over a 15 year lifetime. Emissions and rebates (Small Technology Certificates available under the Small-scale Renewable Energy Scheme) are weighted averages of Australian capital cities using ABS CPI weights.
- 21 <http://www.industry.gov.au/Office-of-the-Chief-Economist/Publications/Documents/energy-intensity/EndUseEnergyIntensityInAustralia.pdf>



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